Educational Metadata for Mobile Learning

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Abstract

We propose an educational metadata schema for use with mobile learning. The development of metadata schemas has been at the core of the learning technology standardisation process. These proposals have been aimed at conventional eLearning on a desktop computer in a formal training and teaching environment. Our aim has been to specify a metadata schema, based on the existing IEEE Learning Object Metadata and IMS Learner Information Profile standards, to cover mobile and informal learning scenarios. In this paper we describe the design process of the Mobile Learning Metadata (MLM) schema; we explain the new fields and structures introduced or amended with the reasons behind them.

Keywords: meta-data; eLearning; mobile learning

1. From eLearning metadata to mLearning metadata

Our aim has been to enhance the existing standards and specification (IEEE LOM [3] and IMS LIP [1]) to support mobile and informal learning. Mobile learning is distinguished by rapid and continual changes of context, as the learner moves between locations and encounters localised resources, services, and co-learners. Informal learning covers any learning that takes place beyond the classroom and formal curriculum, including learning for hobbies, curiosity, personal development, community involvement and everyday survival. It is characterised by learners initiating and managing their own learning projects, for which they may create, store and modify learning content. Mobile and informal learning are brought together in, for example, personal learning organisers [6] which enable people to manage their learning projects and to capture and reflect on everyday events as resources for learning.

2. Designing Mobile Learning Metadata

We began the design process by adopting the IEEE LOM as the basis of our schema design. We amended and added fields to the IEEE LOM to cover the mobile learning scenarios produced by the MOBILearn project (a European Union project in which the University of Birmingham is a core partner, see www.mobilearn.org). We also drafted a Learner Information Metadata schema, which is a collection of information about the learner, based on previous studies of informal learning [5] and a Context State Metadata schema derived from our research on context awareness architecture for mobile learning [2]. Finally, we merged our Learner Information schema with the IMS LIP.

The proposed Mobile Learning Metadata (MLM) consists of 3 top level categories: 1) *Learning Object* which consists of information describing the learning resources, 2) *Learner* which consists of information describing the learner and 3) *Settings* which consists of information describing the context state of the learning environment.

2.1 Extending IEEE LOM

The only changes we purpose to make on the IEEE LOM are regarding rights management. We recognise that learning objects may be created by the learner (in addition to educational institutions) and that they may be shared among other learners. It may also be necessary to allow others (professional organisations

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or respected individuals) to validate the learning object, for example in healthcare and engineering where a person's health may be at risk if inaccurate information is used. We also recognise from the scenarios generated by MOBILearn that restrictions may be placed on the learning object with regard to the location where it can be taken or used. Therefore, we propose to add the 4 new elements: Sharing Rights, Validation, Mobility and Use. Further information can be found at:
http://www.eee.bham.ac.uk/handler/metadata/

2.2 Enhancements of IMS LIP

We propose that the *Learner* category of the MLM should be split into two sub-categories: *Learner Profile* and *Learner Model*. The *Learner Profile* consists of fields for relatively static information about the learner and their preferences, similar to those found in a curriculum vitae, and comprises largely the fields found in the LIP. The *Learner Model* consists of dynamic information relating to the learner's knowledge and learning history. The part of the *Learner Model* relating to the learner's knowledge is not yet fully developed and is therefore not presented here. We should mention, however, that our conception of the learner's knowledge model goes beyond what is described in LIP competency, to include not only competencies in terms of demonstrable knowledge but also descriptions of what the learner knows and can build upon. To model learning history, we adopted the three-level organisation of learning into *Projects*, *Episodes* and *Activities* [5]. *Activity* refers to information related to a distinct learning act, such as reading a paper or discussing with a colleague. *Episodes* are collections of *Activities* that are grouped by thematic, temporal, and/or spatial proximity. *Episodes* may be further grouped into a coherent, but not necessarily contiguous sequence to form *Projects*, based on the learner's objectives and aspirations. The elements that are included in the *Learner Model* part of the MLM and which are either not included in the LIP, or interpreted differently than in the LIP can be found at:
http://www.eee.bham.ac.uk/handler/metadata/

2.3 Context Related Element

The *Setting* category covers the relevant attributes of a context state which include the location of a

learner or a learning object, temporal information and relevant resources available to the learner or the learning object. The list of top level elements within the *Setting* category is presented at *http://www.eee.bham.ac.uk/handler/metadata/*

3. Summary

We have described a proposal to expand the current metadata standards and specifications (IEEE LOM and IMS LIP) for educational systems to support mobile learning. We have discussed elements which we propose to add to IEEE LOM and IMS LIP and the reasons behind them. It is our intention to validate this schema by incorporating it into the MOBILearn system and evaluating it in usability trials of the scenarios.

4. References

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